

Applicants: A. Wesley Prais et al.

Application No.: 10/634,567

Filing Date: August 5, 2003

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AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A syringe assembly comprising:

a syringe barrel; and,

a needle cannula supported by said syringe barrel, said needle cannula having a central axis, an outer diameter in the range of .0130" - .0135", and an inner diameter in the range of .0075" - .0090", said needle cannula having a multi-beveled point including a plurality of planar bevels extending at different angles relative to said central axis, including a primary bevel, a pair of tip bevels and a pair of middle bevels intermediate said primary bevel and said tip bevels, wherein each of said bevels is generally flat.

2. (Original) A syringe assembly as in claim 1, wherein, respective of angles defined between said central axis and a reference plane, said primary bevel is provided at a first planar angle, said pair of middle bevels are provided at a second planar angle, and said pair of tip bevels are provided at a third planar angle, and wherein respective of an angle of rotation about said central axis, said primary bevel is provided at a first rotational angle, said pair of middle bevels are each provided at a second rotational angle, and said pair of tip bevels are each provided at a third rotational angle.

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3. (Original) A syringe assembly as in claim 2, wherein said first and second planar angles are substantially equal.

4. (Original) A syringe assembly as in claim 2, wherein said first and second planar angles are in the range of $8.5^\circ \pm 2.0^\circ$.

5. (Original) A syringe assembly as in claim 2, wherein said third planar angle is in the range of $21^\circ \pm 2.0^\circ$.

6. (Original) A syringe assembly as in claim 2, wherein said second and third rotational angles are substantially equal.

7. (Original) A syringe assembly as in claim 6, wherein said second and third rotational angles are in the range of $22^\circ \pm 10^\circ$.

8. (Original) A syringe assembly as in claim 1, wherein said needle cannula defines a wall thickness between said inner and outer diameters in the range of .00225" - .00275".

9. (Original) A syringe assembly as in claim 1 further comprising a needle shield having an open end and a passage through said open end configured to receive said needle cannula

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and said needle cannula disposed therein, wherein said needle shield is formed of a styrene block thermoplastic elastomer having a Shore A hardness between 30 and 90.

10. (Original) A syringe assembly as in claim 9, wherein said needle shield is formed of a styrene block poly(ethylene/butylene) thermoplastic elastomer.

11. – 18. (Cancelled).

19. (Currently Amended) A syringe assembly comprising:

a syringe barrel; and,

a needle cannula supported by said syringe barrel and having a multi-beveled point, said needle cannula having a central axis, an outer diameter in the range of .0130" - .0135", and an inner diameter in the range of .0075" - .0090", said needle cannula having a lumen and a central axis therethrough, said multi-beveled point provided at one end of the cannula, said multi-beveled point comprised of a primary bevel, a pair of tip bevels, and a pair of middle bevels, wherein respective of ~~an~~ a planar angle defined between said central axis and a reference plane coinciding with a respective said bevel, each of said primary bevel, said pair of middle bevels, and said pair of tip bevels are provided on said cannula at a respective said planar angle, wherein said planar angles of said primary bevel and said pair of middle bevels are substantially equal.

20. (Original) A syringe assembly as in claim 19, wherein, respective of angles defined between said central axis and a reference plane, said primary bevel is provided at a first planar angle, said pair of middle bevels are provided at a second planar angle, and said pair of tip bevels are provided at a third planar angle, and wherein respective of an angle of rotation about said central axis, said primary bevel is provided at a first rotational angle, said pair of middle bevels are each provided at a second rotational angle, and said pair of tip bevels are each provided at a third rotational angle.

21. (Original) A syringe assembly as in claim 19, wherein said said planar angles of said primary bevel and said pair of middle bevels are substantially in the range of $8.5^\circ \pm 2.0^\circ$.

22. (Original) A syringe assembly as in claim 19, wherein said planar angle of said pair of tip bevels is in the range of $21^\circ \pm 2.0^\circ$.

23. (Original) A syringe assembly as in claim 20, wherein said second and third rotational angles are substantially equal.

24. (Original) A syringe assembly as in claim 23, wherein said second and third rotational angles are in the range of $22^\circ \pm 10^\circ$.

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25. (Original) A syringe assembly as in claim 19, wherein said needle cannula defines a wall thickness between said inner and outer diameters in the range of .00225" - .00275".

26. (Original) A syringe assembly as in claim 19, further comprising a needle shield having an open end and a passage through said open end configured to receive said needle cannula and said needle cannula disposed therein, wherein said needle shield is formed of a styrene block thermoplastic elastomer having a Shore A hardness of between 30 and 90.

27. (Original) A syringe assembly as in claim 26, wherein said needle shield is formed of a styrene block poly(ethylene/butylene) thermoplastic elastomer.

28. (Currently Amended) A syringe assembly comprising:

a syringe barrel; and,

a needle cannula supported by said syringe barrel and having a multi-beveled point, said needle cannula having a central axis, an outer diameter in the range of .0130" - .0135", and an inner diameter in the range of .0075" - .0090", said multi-beveled point comprised of five bevels, wherein each of said five bevels is provided on said cannula at a planar angle defined between said central axis and a reference plane, and wherein each of said five bevels is provided on said cannula at an angle of rotation about said central axis, a reference axis being disposed perpendicularly to said central axis, wherein a first planar angle is defined at said bevel corresponding to a first rotational angle, said first rotational angle being measured from said

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reference axis, a second planar angle is defined at said bevel corresponding to a second rotational angle, said second rotational angle being measured from said reference axis, said first and second rotational angles being different with said first and second planar angles being substantially equal.

29. - 30. (Cancelled).

31. (Original) A syringe assembly as in claim 28, wherein said two of said planar angles are substantially in the range of $8.5^\circ \pm 2.0^\circ$.

32. (Previously Presented) A syringe assembly as in claim 28, wherein at least one of said planar angles is in the range of $21^\circ \pm 2.0^\circ$.

33. (Previously Presented) A syringe assembly as in claim 28, wherein at least two of said rotational angles are substantially equal.

34. (Previously Presented) A syringe assembly as in claim 28, wherein at least two of said rotational angles are in the range of $22^\circ \pm 10^\circ$.

35. (Original) A syringe assembly as in claim 28, wherein said needle cannula defines a wall thickness between said inner and outer diameters in the range of .00225" - .00275".

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36. (Original) A syringe assembly as in claim 28, further comprising a needle shield having an open end and a passage through said open end configured to receive said needle cannula and said needle cannula disposed therein, wherein said needle shield is formed of a styrene block thermoplastic elastomer having a Shore A hardness of between 30 and 90.

37. (Original) A syringe assembly as in claim 36, wherein said needle shield is formed of a styrene block poly(ethylene/butylene) thermoplastic elastomer.

38. (Currently Amended) A syringe assembly comprising:

a syringe barrel; and,

a needle cannula supported by said syringe barrel and having a multi-beveled point, said needle cannula having a central axis, an outer diameter in the range of .0130" - .0135", and an inner diameter in the range of .0075" - .0090", said needle cannula having a lumen extending from a first end of said cannula and having an opening defined through said first end, said multi-beveled point comprised of a point with first, second, third, fourth and fifth bevels contiguously bounding said opening, said first bevel contiguously extending between said fifth and second bevels, said second bevel contiguously extending between said first and third bevels, said third bevel contiguously extending between said second and fourth bevels, said fourth bevel contiguously extending between said third and fifth bevels, and said fifth bevel contiguously extending between said fourth and first bevels, wherein said first and third bevels each have a greater length than each of said second bevel, said fourth bevel, and said fifth bevel.

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39. (Original) A syringe assembly as in claim 38, wherein said second bevel is provided on said cannula at a first planar angle, said first and third bevels are provided on said cannula at a second planar angle, and said fourth and fifth bevels are provided on said cannula at a third planar angle.

40. (Original) A syringe assembly as in claim 39, wherein said first and second planar angles are substantially equal.

41. (Original) A syringe assembly as in claim 38, wherein said first, second, third, fourth and fifth bevels comprise a primary bevel, a pair of tip bevels, and a pair of middle bevels, each of said pair of middle bevels being intermediate said primary bevel and one of said pair of tip bevels.

42. (Original) A syringe assembly as in claim 41, wherein, respective of angles defined between said central axis and a reference plane, said primary bevel is provided at a first planar angle, said pair of middle bevels are provided at a second planar angle, and said pair of tip bevels are provided at a third planar angle, and wherein respective of an angle of rotation about said central axis, said primary bevel is provided at a first rotational angle, said pair of middle bevels are each provided at a second rotational angle, and said pair of tip bevels are each provided at a third rotational angle.

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43. (Original) A syringe assembly as in claim 39, wherein said first and second planar angles are substantially in the range of $8.5^\circ \pm 2.0^\circ$.

44. (Original) A syringe assembly as in claim 39, wherein said third planar angle is in the range of $21^\circ \pm 2.0^\circ$.

45. (Original) A syringe assembly as in claim 42, wherein said second and third rotational angles are substantially equal.

46. (Original) A syringe assembly as in claim 45, wherein said second and third rotational angles are in the range of $22^\circ \pm 10^\circ$.

47. (Original) A syringe assembly as in claim 38, wherein said needle cannula defines a wall thickness between said inner and outer diameters in the range of .00225" - .00275".

48. (Original) A syringe assembly as in claim 38, further comprising a needle shield having an open end and a passage through said open end configured to receive said needle cannula and said needle cannula disposed therein, wherein said needle shield is formed of a styrene block thermoplastic elastomer having a Shore A hardness of between 30 and 90.

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49. (Original) A syringe assembly as in claim 48, wherein said needle shield is formed of a styrene block poly(ethylene/butylene) thermoplastic elastomer.

50. (Currently Amended) A syringe assembly comprising:

a syringe barrel; and,

a needle cannula supported by said syringe barrel and having a multi-beveled point, said needle cannula having a central axis, an outer diameter in the range of .0130" - .0135", and an inner diameter in the range of .0075" - .0090", said cannula having a lumen, said lumen extending from a first end of said cannula and having an opening defined through said first end, said first end terminating in a point with a plurality of discrete bevels contiguously bounding said opening, wherein one of said plurality of discrete bevels is located furthest from said point and has a length shorter than any of said other ones of said plurality of discrete bevels.

51. (Original) A syringe as in claim 50, wherein said plurality of discrete bevels comprise a primary bevel, a pair of tip bevels, and a pair of middle bevels, each of said pair of middle bevels being intermediate said primary bevel and one of said pair of tip bevels, wherein respective of an angle defined between said central axis and a reference plane, each of said primary bevel, said pair of middle bevels, and said pair of tip bevels are provided on said cannula at a respective planar angle, wherein said planar angles of said primary bevel and said pair of middle bevels are substantially equal.

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52. (Original) A syringe assembly as in claim 51, wherein, respective of angles defined between said central axis and a reference plane, said primary bevel is provided at a first planar angle, said pair of middle bevels are provided at a second planar angle, and said pair of tip bevels are provided at a third planar angle, and wherein respective of an angle of rotation about said central axis, said primary bevel is provided at a first rotational angle, said pair of middle bevels are each provided at a second rotational angle, and said pair of tip bevels are each provided at a third rotational angle.

53. (Original) A syringe assembly as in claim 51, wherein said said planar angles of said primary bevel and said pair of middle bevels are substantially in the range of $8.5^\circ \pm 2.0^\circ$.

54. (Original) A syringe assembly as in claim 51, wherein said planar angle of said pair of tip bevels is in the range of $21^\circ \pm 2.0^\circ$.

55. (Original) A syringe assembly as in claim 52, wherein said second and third rotational angles are substantially equal.

56. (Original) A syringe assembly as in claim 55, wherein said second and third rotational angles are in the range of $22^\circ \pm 10^\circ$.

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57. (Original) A syringe assembly as in claim 50, wherein said needle cannula defines a wall thickness between said inner and outer diameters in the range of .00225" - .00275".

58. (Original) A syringe assembly as in claim 50, further comprising a needle shield having an open end and a passage through said open end configured to receive said needle cannula and said needle cannula disposed therein, wherein said needle shield is formed of a styrene block thermoplastic elastomer having a Shore A hardness of between 30 and 90.

59. (Original) A syringe assembly as in claim 58, wherein said needle shield is formed of a styrene block poly(ethylene/butylene) thermoplastic elastomer.